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higher than in either American or German tobacco, indicating that the plant had been much 'forced;' and it contained much more lime than usual in proportion to the potash and soda, as well as a high percentage of chlorine. Moreover, water extracted one-third more of soluble matter from English than from American tobacco.

It may be worth noting that this society has now nearly three thousand members, that its journal is entering on its sixth volume (published monthly under the direction of a committee), and that its aims are perfectly distinct from the Chemical society, which deals with pure science, and from the Institute of chemistry, which is mainly an association, for professional and self-protective purposes, of analytical chemists.

A paper on 'Telephonic investigations,' by Prof. S. P. Thompson, is giving rise to three nights discussion at the Society of telegraph engineers and electricians, of which the veteran Sir Charles Bright is now president. The paper, which is well worthy of attentive study, contained an almost exhaustive classification of telephonic transmitters, receivers, and transformers, — an account of the author's numerous researches thereupon, and especially of his 'valve' telephone, — and an elaborate discussion of the effect of heat in microphonic contacts. The author concluded with the following sentences, upon which the discussion mainly turned: "In conclusion, I would reiterate my conviction that the success of long-range telephony depends upon the possibility of devising instruments which, on the one hand, can be used with higher battery power to transmit stronger currents, and which, on the other hand, will be adapted to receive these currents by means of apparatus which, though not necessarily more sensitive to small currents than the present receivers, will have a higher electrical and mechanical efficiency. And I am convinced that the path of progress lies very near the road already travelled by those who have perfected the existing machinery for the electric transmission of power."

The direct opposite of this was very stoutly maintained by Mr. Preece, head electrician of the post-office telegraphs, who argued that both on theoretical grounds, — viz., that, in Sir W. Thomson's law, the value of a in the equation

$$a = CKr^2$$

was independent both of current and of electro-motive force, — and also as the result of practical experiments, a great number of which were quoted, long-distance telephony was a question, not of instruments, but of line.

At the annual meeting of the Physical society of London, held this afternoon, Prof. Balfour Stewart was re-elected president, and Dr. E. At-

kinson, who for many years has been treasurer, was elected a vice-president, while Prof. A. W. Rücker (the recently appointed successor to the late Professor Guthrie at the Science schools, South Kensington) was appointed treasurer. The society adopted an alteration of its rules, whereby membership of a foreign or colonial scientific society shall in future be held equivalent to the personal knowledge, on the part of members of the society, of candidates for its membership. W.

London, Feb. 12.

GEOGRAPHICAL NOTES.

Africa.

The latest letter of Dr. O. Lenz is dated December, 1886. On June 30 he left Kasonge, which was being ravaged by small-pox. After he had left the village the disease broke out among his caravan, and among those who died of it were his own and Bohndorf's servants. On the 7th of August he reached the Tanganyika, where he met with the English missionaries. He crossed the lake to Ujiji, whence he wished to go north. However, on account of the war between the Arabs and northern tribes, he was unable to continue his journey, and was obliged to proceed towards the east coast. He did not follow the well-known route from Ujiji to Bagomoyo, but chose the Zambezi route. He crossed the land between the Tanganyika and Nyassa, went by boat over Lake Nyassa and down the Shire and Zambezi. Having reached Kwilimane at the mouth of this river, he embarked for Zanzibar. His arrival there was announced a short time ago.

Le mouvement géographique of Feb. 15 contains an interesting sketch-map of the district north of the Kongo by A. J. Wauters, showing the present state of our knowledge of the hydrography of that country according to the explorations of Junker, Grenfell, Lupton Bey, and Flegel. The Welle-Makua has been copied from a sketch furnished by Dr. Schweinfurth, and shows the important discoveries of Dr. Junker.

Stanley has left Zanzibar for the Kongo. At the same time the famous Arabian trader Tippu-Tip started for Stanley Falls, and has promised to support Stanley's expedition.

The January number of the *Bulletin* of the Paris geographical society contains an accurate map of the Ogowe in West Africa by Lieutenant Mizon, and of his return journey to the coast. In the paper which accompanies the maps, Mizon describes the methods of observation, and gives the positions of some of the more important points. The maps are on the scale of about one kilometre to an inch, and contain a great deal of topographical and orographical detail.

America.

The Hudson Bay company last autumn completed a steamer for the lower part of the Mackenzie River. Trial trips were made on Great Slave Lake, and next summer she will run to Peel River, near the mouth of the Mackenzie.

The Geographical society of the Pacific at San Francisco announces the recognition of the new monthly journal *Kosmos*, edited by C. Mitchell Grant, as its official organ. The new periodical will give reports on the meetings of the society. Though its plan includes all branches of science, the first number is largely devoted to geography. We find in it a description of the ascent of Mount St. Elias by H. W. Seton-Karr, and a paper by Prof. George Davidson on 'Submarine valleys on the Pacific coast of the United States.' The resuming of publications by the geographical societies of San Francisco and Mexico shows that interest in geography is increasing in America.

Polar regions.

Mr. Alexander McArthur, formerly an employee of the Hudson Bay company, left Winnipeg, Feb. 13, on an exploring expedition to the polar regions. He intends to go from Winnipeg to Fort Churchill, and to continue his journey along the west coast of Hudson Bay. While Gilder proposes to push north by the way of Fury and Hecla Strait, McArthur prefers to go north-west by the way of King William Land and Boothia Felix, the ill-famed districts of Ross's sufferings in 1829-33, and of the loss of the Franklin expedition. He intends to stay a winter on King William Land, and to go north in the ensuing winter, crossing Lancaster Sound, and following the west coast of North Devon. From there he proposes to cross to the little-known islands of Jones Sound and thus reach the west shore of Grinnell Land, which, he hopes, will prove a safe route north. He expects to be absent some three or four years. This plan of reaching the north pole will undoubtedly be as unsuccessful as Gilder's. Gilder has ample experience in arctic travelling, and consequently does not attempt a route that is even unknown to the Eskimos. The way he intends to go is inhabited by natives, and, under favorable circumstances, he may have a chance to reach Lancaster Sound in the spring of 1889. Whether he will be able to cross Lancaster Sound is doubtful. The Eskimos travel very rarely across this strait, and the journey can be accomplished only in favorable years when it is frozen over, which does not occur often. As steam-whalers go every year to Smith Sound and Pond's Bay, Gilder's plan cannot be considered a good one, though he might do considerable geographical and ethnological

work between Fury and Hecla Strait and Pond's Bay. He will have the greatest difficulty in getting Eskimos to go along with him across Lancaster Sound. Food is very scarce on this journey, and many stories of the natives referring to families crossing Lancaster Sound are full of the horrors of starvation and cannibalism. The natives of Cape Isabella are said to be comparatively well off, and these are the only ones who can help an explorer along. We cannot see any reason why a traveller who intends to explore the extreme north should not start from the nearest available point instead of wasting his time and strength on a hazardous journey for which there is no necessity. Mr. McArthur may succeed in reaching King William Land, as there exist two or three routes to that country which are used by the natives, — one from Chesterfield Inlet, another from Wager River, and a third along the coast of the Gulf of Boothia. Rae and Hall used the last, and Schwatka the second route. As, however, the Eskimos of King William Land and Boothia do not travel farther north than Bellot Strait, and since 1833 do not even visit this part of the coast, and as they are not at all acquainted with the more northern parts of the Arctic Archipelago, there is not the slightest chance for McArthur to get along on this route. Explorers like McArthur and Gilder may accomplish considerable and valuable work when they confine themselves to a task adequate to their means and the strength of a single man, but the accomplishment of their plans is almost impossible. The exploration of Jones Sound is one of the most important problems of the geography of arctic America, and it may be accomplished by a few men at a small expense. Gilder is a man of extensive experience in travelling in the Arctic, and we may be allowed to express the wish that he should give up his present plan and apply his energies and skill to this important work which he will be able to accomplish.

NOTES AND NEWS.

NOT long ago Nicolaier, working in Flügge's laboratory, found a bacillus which had the power to produce in animals the phenomena of lock-jaw (*tetanus traumaticus*). Afterward Rosenbach succeeded in obtaining the same bacillus from the wound of a man who had died of lock-jaw. L. Brieger has recently prepared from flesh a ptomaine which produces in animals the same symptoms as those which are produced by injecting the specific tetanus bacillus. To the substance he gives the name 'tetanine.' He has, further, found the same substance in human cadaver which had